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Training For The Mission To Hiroshima

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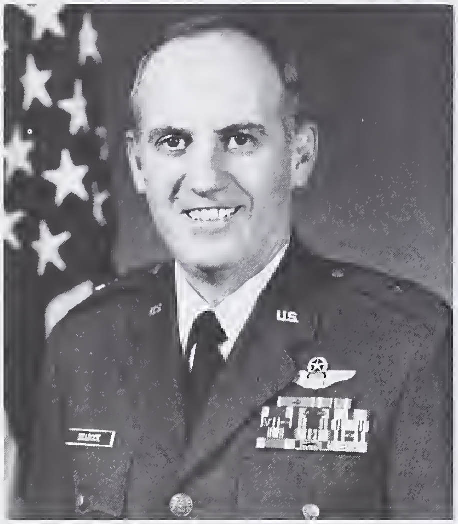
Combat Crew

strategic air command

AUGUST 1987

★★★★

Amateur or Professional



Brig Gen Charles J. Searock, Jr.
Deputy Chief of Staff, Logistics

One definition of logistics is that aspect of military science dealing with procurement, maintenance and transportation of military materiel, facilities and personnel. The origin of the word, however, is the Greek word logistikos which means the art of calculating. Educated guessing does play a role in logistics support and quite often an educated guess made in Operations, Intelligence or Plans is vital to Logistics. In the popular novel **Red Storm Rising**, author Tom Clancy writes "amateurs discuss tactics . . . professional soldiers study logistics." I firmly believe that those of you who aspire for leadership roles in the Air Force must understand the relationship of logistics to combat capability and the dire consequences of miscalculation. Let me illustrate with some examples from our current conventional enhancement effort which impact aircrew training.

One of the first Logistics actions was to provide all bomber units with conventional munitions release and support equipment to facilitate expanded aircrew training. Outfitting both FB-111 units was no problem because ample gear was stored at depot. The B-52 situation, however, was far different. Basically, we were obligated to keep OPLAN tasked units fully equipped so that their missions would not be impaired and we tried to provide remaining units enough conventional support gear to allow configuration of one-half of their assigned aircraft for conventional operations. However, the equipment required to meet this objective does not exist. It was salvaged after operations in Southeast Asia were terminated! I find it difficult to rationalize how this miscalculation happened but we have to accept the fact that it did occur. We are now buying additional support equipment, but it will take time to procure and distribute.

Expanded aircrew training also created a demand for substantial quantities of training munitions—both live and inert. This demand far exceeded available stocks of allocated training munitions. A portion of the problem is attributable to the fact that procurement of conventional munitions is often cut back during the budget process. Another portion of the problem, however, is our own fault. For years, SAC, among other MAJCOMs, would forecast for aircrew training munitions and then not use more than a small fraction of the bombs that were allocated. If we were running a savings account, we would have built up a nice nest egg, but our activities had the exact opposite effect upon training munition procurement. The munitions procurement system has many internal checks and balances and is frequently subjected to audits by the Government Accounting Office. When on-hand stocks of training munitions reached what appeared to be a several year's supply based upon actual use rate, funding was drastically cut and some items went entirely out of production. It's going to take time to get production back up to a level which will support our requirements. This acute shortage actually resulted in one improvement which must be reported. In our frantic search to find some assets to use for training, the BDU-48 was discovered.

This is a small, inexpensive training shape which replicates the ballistics of the MK-82 retarded bomb. A crash DO/XP certification program was undertaken which led to certification for B-52 external release. Arrangements are being made with the Navy to acquire enough of these to provide necessary training, quickly.

The last miscalculation to be addressed deals with an aircraft modification. Because ALCM equipped B-52s were not projected to have a conventional role, provisions were not made to retain external conventional capability when the aircraft were modified to carry ALCM pylons. As a result, conventional pylons will not mate to ALCM modified wing stations. Happily, I can report that a solution to this problem has been found. Unhappily, I have also to report that the fix will cost more than it should have, had we not miscalculated during original ALCM modification contract design.

"Logistikos: The art of calculating" is not as exact as we would prefer. We can, however, overcome that shortcoming through good, detailed planning. The loggie can deliver exactly what you want when he knows exactly what you need. We cannot go to war without POL, spare parts or munitions. Assets cannot be malpositioned. Fuel at base X cannot support operations from base Y unless transportation has been planned. Tactics are useless unless the logistics support for operations has been established—First! ★

Combat Crew

Magazine of the Strategic Air Command — 37th Year of Publication

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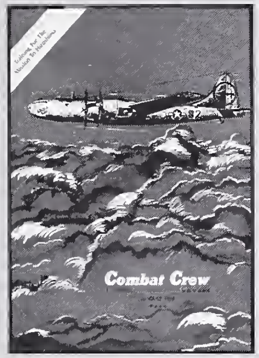

ON OUR COVER

Forty-two years ago this month, the crew of the Enola Gay ushered in a new era in warfare. Were the participants in this historic event prepared for their mission? Turn to page 4 and find out.

SACRP 127-1 VOL. XXXVII NO. 8 AUGUST 1987

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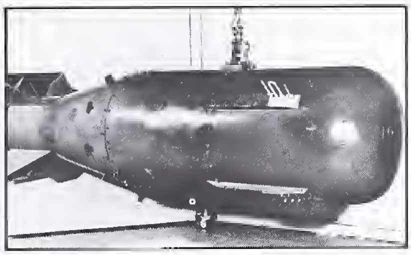

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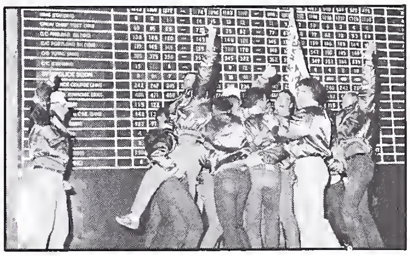

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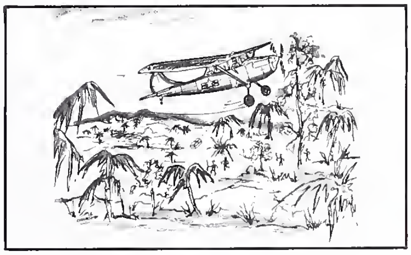

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NEXT MONTH . . .
Anniversary time

At 0245 on 6 August 1945, Col Paul Tibbets took the controls of a modified B-29 named "Enola Gay" and lumbered into the air from Tinian Island. Once safely airborne, Navy Capt William Parsons climbed into the cramped bomb bay and armed their special cargo—a 9,000 pound atomic bomb called "Little Boy." After more than six hours of tough overwater navigation, "Special Bombing Mission 13" was lined up with the target—Hiroshima—directly ahead.

At 0815 Hiroshima time and only 17 seconds from the scheduled drop time, the bombardier, Maj Tom Ferebee, released the weapon. Despite a diving turn to escape the weapon's shock, Col Tibbets had to fight the violent turbulence created by the blast. After they were safely away from the explosion, he announced to the crew, 'Fellows, you have just dropped the first atomic bomb in history.' Eight days later, Emperor Hirohito announced Japan's surrender.

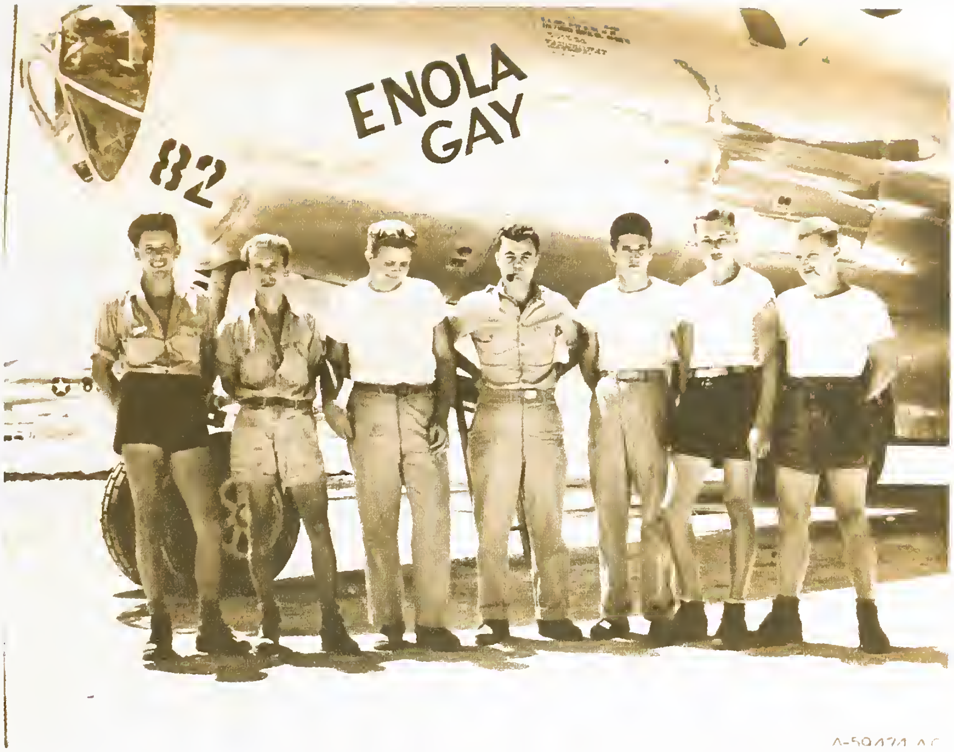
Training For The Mission To Hiroshima

Maj Raul C. Bennett

This event was the culmination of dedicated training and the leadership of Brig Gen Paul W. Tibbets, USAF retired. At the age of 29, he was selected to head the strike force of the first atomic bomb project and was responsible for recruiting, organizing and training personnel to drop the bombs that would lead to the end of the war with Japan.

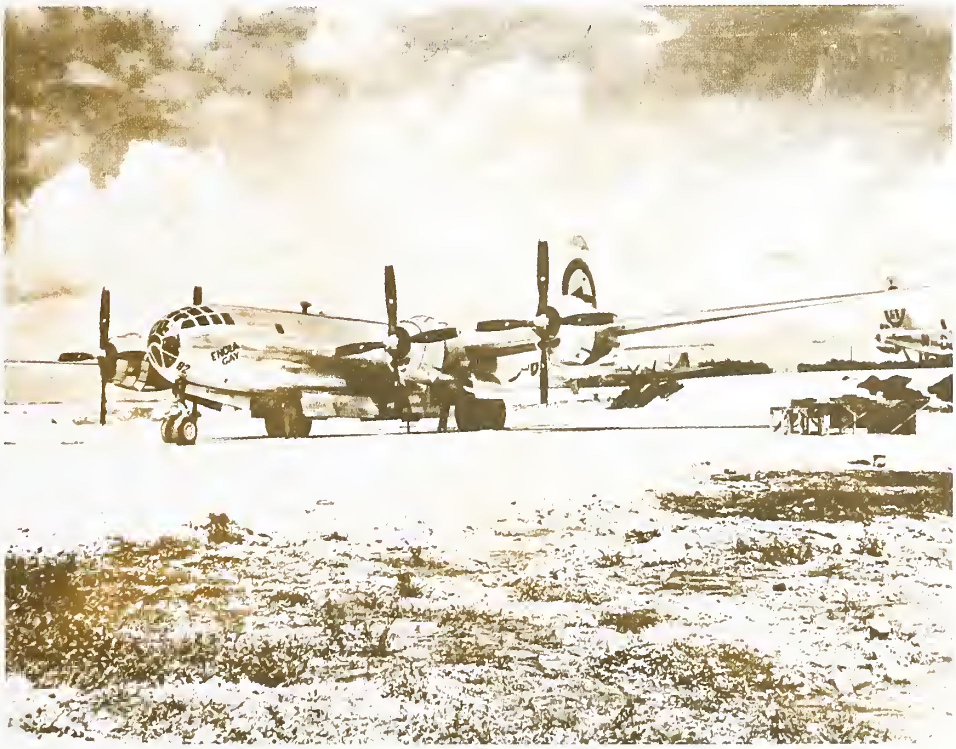
After returning from the war in Europe, then Lt Col Tibbets was selected to form the initial cadre of B-29 instructor pilots to train at Grand Island, Nebraska. His assignment to Grand Island was cut short when he was selected to command the 509th Bomb Group and prepare them for their historic missions. Although some of the crews were experienced and more qualified than crews he had trained before, the tactics had now changed due to the yield of the weapon and the increased requirement for accuracy. In this process of developing new tactics, the group trained at Wendover, Nevada and additionally staged out of Cuba for overwater training.

The initial cadre for what was later to become the 509th Composite Bomb Group (VH), was the 393d Bombardment Squadron (which now flies the FB-111) of the 504th Bomb Group. They had just completed their training and were alerted for overseas movement. None of the assigned personnel had seen combat, and even though they had established the highest training record in Second Air Force, Col Tibbets knew a higher degree of proficiency was needed. He requested and got a cadre of key people who had either flown with him in Europe, North Africa, or in the B-29 testing program. This group could teach the 393d crews what had to be done. To quote Gen Tibbets, ". . .their initial charter was to teach the pilots how to get the maximum out of the planes, the navigators to navigate to within a quarter of a mile of the target and get the bombardiers' average bomb error from the training standard of 1000 feet at 20,000 feet to under 500 feet at 30,000 feet."



The ground crew of the B-29 "Enola Gay" after the first atomic bombing mission on Hiroshima, Japan. Col Paul W. Tibbets, the pilot, is in the center.

"Enola Gay," the modified B-29 which dropped the first atomic bomb, is shown on Tinian Island. On August 6, 1945, the Enola Gay lumbered into the air with a special cargo — a 9,000-pound atomic bomb called "Little Boy."



As for individual training requirements, the difficulties encountered were varied and numerous. For example, the bombardiers came straight out of training and lacked proficiency with the Norden bombsight. Generally, they could not tell the difference between an error they had made from one induced by a failure or malfunction of the bombsight. Additionally, the pilots were flying an unstable platform which induced bombing errors (sound familiar?) that neither the pilots nor the bombardiers were recognizing. Navigators had to be trained to help the bombardiers determine wind direction and velocities in advance so that the bombardiers could preset some of the information into the bombsight to facilitate "killing the drift" on the bomb run. This is not to say these men were not good. In a historical perspective, we have to remember that crew members were the product of compressed training and because of the massive numbers needed and shortage of time were not honed to perfection.

Additionally, a policy of Flying Training Command at the time was to keep graduating students as instructors if needed for subsequent classes. This greatly reduced the quality of the product. So the 509th went back to the basics and upgraded the training level of the navigators of the 393d from a "Baccalaureate to a PhD." The pilots had to be taught the capabilities and limitations of the B-29. But more importantly, they had to learn their own capabilities and limitations. They did most of their training in the airplane rather than in the classroom with the exception of some extensive courses on aircraft systems. Once the crews became a proficient fighting unit over the western deserts, it was necessary to move to a site more amenable to overwater training—Cuba.

The move to Cuba and the Caribbean brought crew coordination into sharp focus. Overwater navigation and the water to land contrast for the bombardiers and navigators posed several problems. When bombing a target where the entire approach is made over land, the bombardier encounters fewer problems establishing his rate of closure with the target than when making the approach over water. This is due to the water not having any characteristics which afford the opportunity to detect rate of closure. Hence, the bombardiers were unable to establish a reliable ground speed which, along with altitude, was needed to consult the bombing tables to determine the "trail" setting (the horizontal distance the bomb lags the aircraft at impact) that had to be set into the bombsight. Invariably, a new bombardier would bomb over the aiming point until he made the approach several times.

The final training needed before deployment to Tinian was learning the breakaway maneuver. This maneuver was developed after a scientist on the Manhattan project told Tibbets that unless the bombing airplane "reversed course," it would theoretically be over the target at the time of explosion. The scientist stated that the quickest way to get away from the ever expanding shock wave was to get tangent to its circle. They computed the tangency to be a turn of 159 degrees from the run in heading. Col Tibbets took a B-29 up to 30,000 feet and started making timed turns, tighter and tighter, until the tail began to stall. The intensity of the buffet told him when he had gone far enough. This turned out to be 50 to 55 degrees of bank for about 48 seconds. Once he had this figured out, Tibbets worked it into the training procedures and every pilot was checked out in the maneuver.

The training paid off and the crews improved their proficiency. The competition was keen between the crews to do well. In a recent interview, Gen Tibbets commented that the competition among the crews was an enhancement to the training while they were preparing for the special missions.

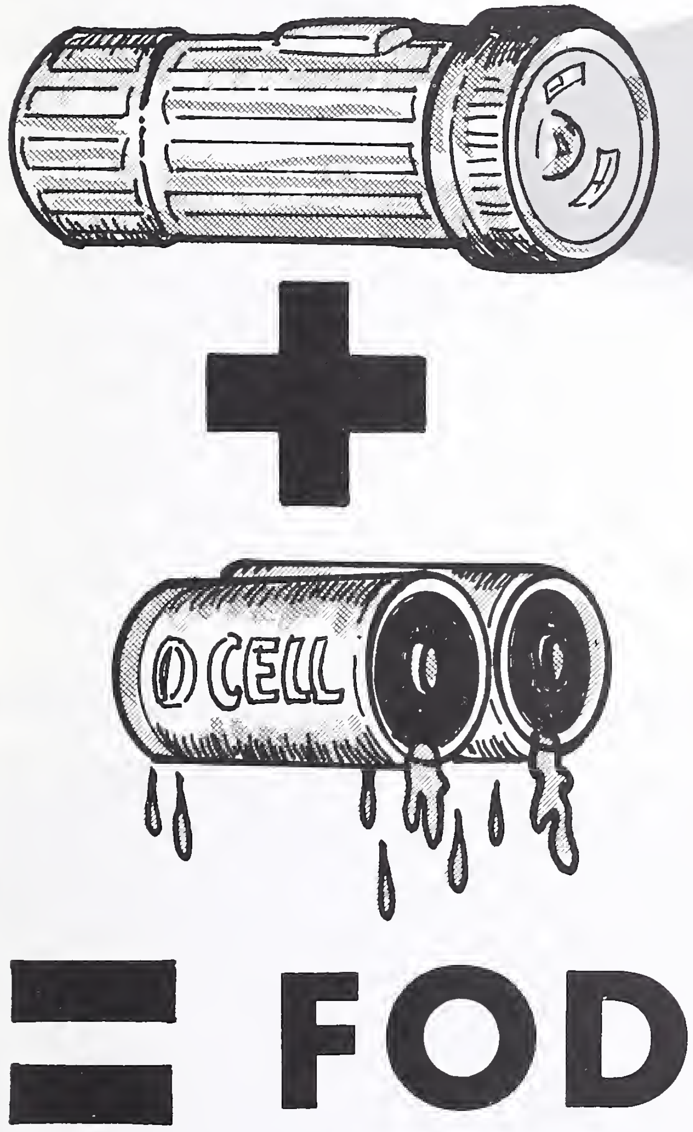
"Once the crews found that they could do better than they imagined by listening to the old hands, they became eager to learn more and took pride in what they were doing. Individuals on a crew took a special interest in the other fellow and encouraged each other to do better. Crews became cohesive units. I saw this as a healthy thing and a great morale builder for the whole unit."

By the time the 509th got to Tinian, the crews were good. The only thing lacking was combat experience, and this was gained by flying individual combat sorties against some refineries in Japan with a single conventional bomb that weighed 10,000 pounds.

The innovation and dedication of the 509th Bomb Group and Gen Tibbets in preparing for the first atomic delivery required extraordinary dedication. The preparations called for a positive attitude and involved lessons that have contemporary significance for our current strategic bomber crews.

About the author: A 1974 ROTC graduate from Kent State University, Maj Bennett also holds a master's degree from Central Michigan University. He is a senior pilot who flew B-52s at Carswell and Wurtsmith AFB before serving as a CCTS instructor at Castle AFB. This article was written while Maj Bennett attended Air Command & Staff College.

Hazards of Foreign Objects Lost in Aircraft



Lt Col Richard L. Stewart
71 AREFS, Barksdale AFB

During a recent KC-135 launch which was aborted for an electrical problem, the crew chief noted a water leak from a panel drain in the right wing root. Although the electrical defect was corrected, the crew elected not to take the aircraft and to have the leak inspected. The leak was small, short-lived, and almost insignificant except for the fact that it was most unusual. Neither the crew chief nor the aircrew had ever experienced a leak of this nature. Thereby hangs a tale!

To make a long story short, it is sufficient to say that the mission was canceled after a five hour maintenance delay. People from four different shops were called out to disassemble the outboard water injection pipe from the leading edge of the right wing so it could be replaced. Extensive corrosion was found due to foreign object damage **(FOD)** inside the bleed air bay in the wing leading edge which also carries water and hydraulic lines to the wing mounted engines of the KC-135.

This FOD was caused by an innocuous looking black plastic flashlight which once contained two D-cell batteries. The flashlight was a type no longer used by maintenance personnel, and it had no identification marks or numbers. It had apparently been in the wing for years. It was found lodged against a clip on the bleed air duct which had partially melted the flashlight case. The case was also scored by aileron control cables which were rubbing against it. Due to heat and vibration, the lens had come off the flashlight releasing the batteries which became lodged against the plumbing in the wing.

One leaking battery caused the holes in the water pipe which holds 60 psi during water injection takeoffs. The leak accumulated and drained about 15 feet away at the wing root. The other battery "ate" about one and one-half inches of a vertical beam mount which supports the plumbing. It was proceeding to cause a hole in the lower wing panel and the hydraulic line from the number three engine. Since the wing panel is much thicker than the hydraulic line, the corrosion would most likely have gone undetected.

In time this would have caused a high pressure spray of hydraulic fluid into the bleed air bay, probably resulting in a fire on the forward side of the number three main fuel tank. A very serious inflight emergency and possible loss of the aircraft is not hard to imagine, not to mention danger to the crew.

Hats off to the crew chief who was alert enough to see and report a small water leak in the dark of an early morning launch in the pouring rain!

Probably the person who lost the flashlight in the wing never imagined that two D-cell batteries could cause such serious corrosion. None of the crew could either. It had to be seen to be believed! Let's all learn from this incident. **FOD is deadly!**

Take It Around!

Maj Gary Dutelle
HQ SAC/DO8

All of us have been in a situation where "poor judgment" has led us to a landing we "walked away from," but could just as easily have been our last! I know I've had approaches I'm not particularly proud of, and landings one of my friends liked to call knee-knockers. You know—bounce, land, jump on the blinders so hard that your knees knock together when you stop. More than once I've had cold, sweaty hands and heard the little voice say, "Why didn't you take it around? You were lucky this time!" I think we can all admit there are pressures out there causing us to avoid good judgment or at least temporarily ignore the possible hazards of a given approach.

Many of us have learned to accept decision height as the absolute last opportunity to go around; beyond it we are committed to accept our best attempt at a landing—or are we? Let's take a look at a few examples taken from anonymous testimonials on events in the

> **“I know I’ve had approaches I’m not particularly proud of, and landings one of my friends liked to call knee-knockers. You know—bounce, land, jump on the binders so hard that your knees knock together when you stop.”**

landing environment, some made possible by luck, not good judgment.

“I’d already been to Hawaii many times,” said the seasoned KC-135 IP as he told me this vignette. The allure of the beaches, warm weather, and scenery called to me as we crossed the coast of California. I remembered legends of takeoffs over Waikiki Beach at maximum gross weight before they built the reef runway and thoughts of only perfect landings haunted me as we sighted the island. Let’s face it; no one ever goes around at Hickam! You follow airliners on a long visual approach to a short runway at a civilian airport. Even if I wanted to go around, I’d heard rumors of how the rising terrain makes it difficult; how everyone gives you a hard time if you overfly downtown Honolulu; and of course, the passengers wouldn’t approve of a go-around especially now, so close to our destination of fun in the sun. So on I pressed, off airspeed, above glideslope and I was even so confident I let the copilot attempt his first strange field landing! You guessed it! We landed long and I hopped on the brakes hoping to stop in time to turn off on the cross runway. As we passed the turn off at 60 knots I braked even harder, and as we finally slowed enough to turn off—at the end of the runway—I knew we had set the stage for hot brakes. It could have been a lot worse; and you know, a go-around would have avoided it all and cost us only a few more minutes instead of the long hours I spent asking myself why I didn’t just “take it around?” Pride—we’ve all been there.

Or how about another example set up by pressure to get that mission done? “I was on a medivac mission taking a patient into Peterson Field from Ellsworth,” recalled an IP I recently spoke with, thinking back to his early days as an aircraft commander. “Of course you can see the urgency of the task? And when the winds were called at 30 knots of direct cross wind, I thought about my unstable approach, due of course to the moderate turbulence I encountered along the mountains into Pete field. But this was an important mission. As I broke out of the clouds at minimums I found myself far to the left of centerline on a 150 foot wide runway. We touched down well left, so far left engines one and two were over the grass. But it was worth it. We got the patient on the ground and only had to wait a short time for the ambulance to arrive, just about the same amount of time it would have taken to go around.” Mission pressure—you’ve all been there, haven’t you?

Of course there are some of us so good we can recover from just about any approach, right? How about the story I was told by a B-52 AC who spent his early years at Wurtsmith. “You come in over the water on a long approach into runway 24 at Wurtsmith. I’d flown it many times. I knew the area, so I pressed below the overcast and **below minimums.** I knew the runway had to be there somewhere, and I was good, so I thought I could bend the rules a little. We broke out and there we were, heading right toward the alert facility, and runway 24 was far to my left. I can make it, I remember thinking, so I banked left, kicked in a little rudder, overshot, swooped back to the right, arrested my sink rate and almost wired it, almost. The crab I still had in was enough to scald two tires, and blow one of them. Sloppy approach, really, but I saved a landing. I should have gone around. Overconfidence. I knew it then and should have realized it **before** I tried to salvage that approach.” Haven’t some of us been there too?

Now I don’t want you to think that you can’t be influenced by outside pressure or opinion in the decision process. What about this pilot carrying CDVs into Offutt. “I was chosen because I was the best available, they told me, and they knew I could do the job. I made my approach through heavy weather and had a really unstable final. I took it around, and after the flight the ops officer heard about it and ribbed me for going around. The word got out that I was “weak” and couldn’t handle it. Next time, I thought, I’ll land—no matter what kind of approach it is, I won’t take that kind of abuse again.” Supervision—you can really be influenced by what you believe is expected of you. We’ve all been there!

This final story was given to me by a very experienced pilot fairly new to the KC-135. Now, of course there can be times when you’re late and the whole world is waiting for you. The mission had gone smoothly except for our late departure, and the winds hadn’t helped us regain the time. At last we were on final to 01 at K. I. Sawyer. We had a full load of DVs and my approach that day was a little shaky. I was not stable and by the time we reached minimums I was not in a good position to land. I could see the white top and the line of staff cars waiting for our arrival, parked along the taxiway to my right. It won’t look good if I go around. But I’m not set up for a safe landing so I said “Take it around!” Pickle, power, speed brakes, flaps and away we went! “It’s more important to take it around,” said the pilot, General John Chain, “than to try to salvage a bad approach by making a bad landing.” Remember, it always has been and always will be good advice, **“If you don’t like it—take it around.”**

1987 SAC Combat Weapons Loading Competition

Lt Col Robert W. Carmichael, Jr.
HQ SAC/LGWC

Fairchild AFB will again host the annual SAC Combat Weapons Loading Competition scheduled for 13-20 August. The traditional Giant Sword nickname has been reassigned following some field level inputs to General Chain on a base visit earlier this year. All of SAC's 18 bomb wings will be represented, even though only security police elements will be competing from Dyess, Ellsworth, Grand Forks, and McConnell AFBs, which are involved in transitioning to the B-1B aircraft. Additionally, security police teams from five non-bomb wing units will be added to the competition this year. These bases are Grissom, Offutt, March, Vandenberg, and Beale. These units will be competing for separate security police trophies and will not be eligible for the Barrentine Trophy.

Last year, the 5 BMW, Minot AFB, won the Barrentine Memorial Trophy—the top trophy of the competition. The trophy was named after CMSgt Wilbur R. Barrentine, a SAC munitions loader from the mid-fifties until his death in 1970. The 5 BMW also captured the Best Bomber Crew Chief award for the second consecutive year.

The competition is intended to promote a competitive spirit among units, improve munitions loading, display aircraft crew chief and security police skills, and aid in the evaluation of new concepts. **Esprit de corps** of competing units is enhanced by the high pressure competition in which only SAC enlisted personnel compete.

The 3000 total points are divided among the three distinct competition areas: munitions (1400 points), aircraft crew chief (400 points), and security police (1200 points). In addition to being evaluated during two different loading operations, munitions personnel will be administered a written test, and their equipment will be inspected prior to each loading operation. Aircraft crew chiefs will be evaluated in their preload and postload procedures, as well as given a written test.

This year a conventional load has been added to the munitions portion of the competition. However, since the level of effort for nuclear and conventional loads are so different and not all units are equally conventional capable, the conventional load has been added

RECENT AWARD WINNERS

BARRENTINE WINNERS

1986 5 BMW, Minot AFB
1985 509 BMW, Pease AFB
1984 28 BMW, Ellsworth AFB
1983 416 BMW, Griffiss AFB
1982 28 BMW, Ellsworth AFB

BEST MUNITIONS LOAD CREW

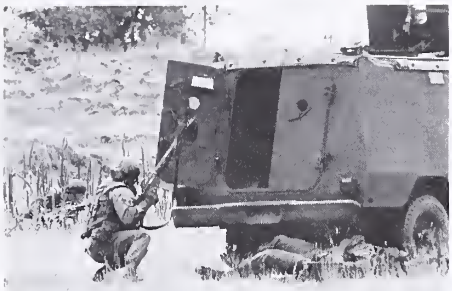
1986 7 MMS, Carswell AFB
1985 509 MMS, Pease AFB
1984 93 MMS, Castle AFB
1983 43 MMS, Andersen AFB
1982 410 MMS, K I Sawyer AFB

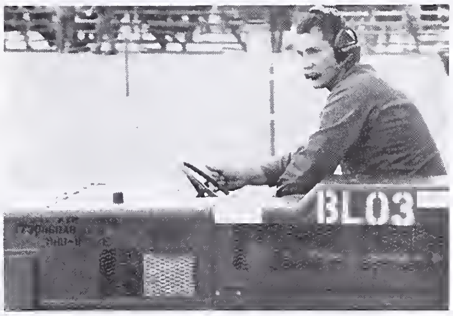
BEST SECURITY POLICE TEAM

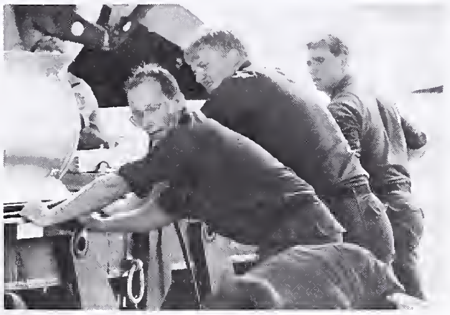
1986 96 SPS, Dyess AFB
1985 96 SPS, Dyess AFB
1984 44 SPS, Ellsworth AFB
1983 320 SPS, Mather AFB
1982 44 SPS, Ellsworth AFB

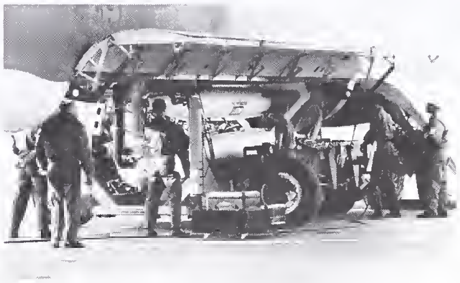
BEST BOMBER CREW CHIEF

1986 5 OMS, Minot AFB
1985 5 OMS, Minot AFB
1984 28 OMS, Ellsworth AFB
1983 42 OMS, Loring AFB
1982 28 OMS, Ellsworth AFB









for those units specifically tasked for conventional operations in OPLANS. These units will load simulated 500 pound bombs on external MER or BRU stations. This load will be scheduled after the unit has completed its nuclear loads and a separate traveling trophy as well as individual trophies will be awarded.

For the Barrentine Trophy each competing wing will continue to perform a gravity weapon load and a missile load. B-52 units with an ALCM commitment will load a pylon with these missiles while other bomb wings will load SRAM.

Security police personnel will compete in four separate events designed to test their initiative, skill and knowledge in dealing with threats to the security of nuclear resources. A confidence course and combat rifle course will test the physical skills of the competitors, while a written test will help determine overall job knowledge. A tactics exercise will test the teams' ability to protect assigned resources from external threats. Units without a nuclear commitment will have a different tactics exercise than nuclear committed units. The competition will culminate in an awards banquet 19 August, in nearby Spokane, Washington. In addition to the Barrentine Memorial Trophy, other major awards presented include the Best Munitions Load Crew Trophy, Best Security Police Unit Trophy, and Best Bomber Crew Chief Trophy.

Regardless of the outcome, preparing for the Combat Weapons Loading Competition is a difficult and arduous job that has occupied a significant portion of each competitor's summer. Motivation and spirit are at a fever pitch and will reach their peak at the competition. Even though only one team will take the Barrentine home, there are no losers in Giant Sword, where the best of the best compete.

Galaxy Flight 203

On 21 January 1985, Galaxy Airlines Flight 203, a Lockheed Electra charter flight, departed runway 16R at Reno-Cannon International Airport. Approximately two minutes later the airplane crashed, killing the crew of six and 64 of the 65 passengers, and contributing to the worst year on record in civilian aviation.

Mishap Sequence

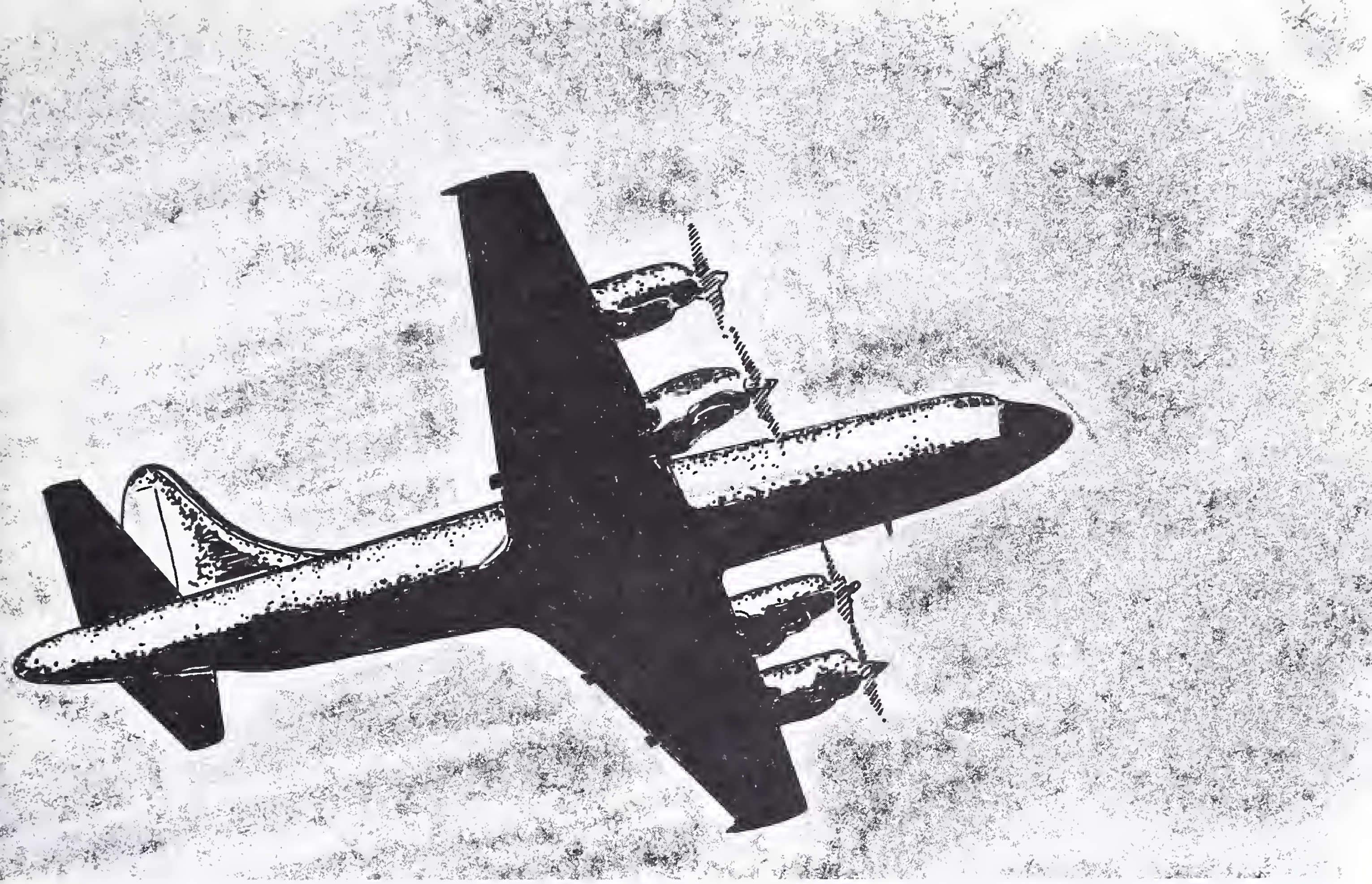
Shortly after midnight on the 21st of January, the crew of flight 203 was completing their interior preflight. At 0021 PST they received their ATC clearance for the flight to Minneapolis. At 0055 the crew prepared for engine start and the captain asked the first officer several questions concerning the departure. The cockpit voice recorder (CVR) indicated the before start checklist was not completed properly. Specifically, the captain did not respond to the flight engineer's check items; ten check items were skipped and six items were called for in incorrect order. Additionally the required predeparture briefing was not recorded on the CFR. After the outboard engines were started, the ground handler was unable to disconnect the air start hose from the aircraft. The ground handler's supervisor left his position and disconnected the hose. However, he could not remember closing the air start access door, although he thought he did. At 0103 engine power was increased for takeoff. The first officer called V-1 at 108 knots when an almost simultaneous "thunk" sound was heard. Four seconds later, he called V-2 at 120 knots, followed by another "thunk" sound. The gear was retracted, and three seconds later the captain asked the flight engineer, "What is it, Mark?" The flight engineer confirmed throttles at the takeoff power setting and three seconds later the captain ordered the flight engineer to "pull 'em back." Then, one minute after takeoff, the pilot directed the first officer to request a turn to a left downwind. The captain directed the first officer to "tell 'em we have a heavy vibration." The tower cleared Galaxy 203 to maintain VFR and enter a left downwind.

Following that transmission, the first officer began answering a series of questions from tower concerning their emergency status and intentions. One minute 30 seconds after takeoff, the ground proximity warning system sounded. Four seconds later the first officer said, "A hundred knots." He repeated this three seconds later. The last recording on the CVR was the sound of impact, recorded six seconds later.

Analysis

From the brief mishap sequence you might be led to think that some uncontrollable vibration rendered the aircraft incapable of flight; let's see how the National Transportation Safety Board (NTSB) analyzed this mishap. The board concluded that the air start access door was not closed properly when Galaxy Flight 203 took off. Once airborne the open access door pivoted forward, up and above the leading edge of the wing. A spoiler type effect of the open access door disrupted the airflow over the wing and created the vibrations reported by the flight crew. However, the board did not believe the vibrations caused the accident, since there was not evidence of problems controlling the airplane. If the plane was controllable and the vibrations were not found to cause the mishap, why was an experienced pilot and crew unable to safely return the plane to the airport? Let's take a closer look at the captain's actions. Shortly after takeoff, with all engines operating normally, the captain called for a power reduction in response to a heavy aircraft vibration. He obviously suspected the engines or propellers as the source of vibration, and when the power reduction did not solve the problem it directly affected his subsequent action and the sequence of events leading to the mishap.

As we sit back and comfortably analyze the fate and mistakes of Galaxy Flight 203 we may think — if the



power reduction on all four engines didn't solve the vibration problem, why weren't the throttles simply re-advanced? Two human factors experts, Hart and Bortolussi have found that inflight errors committed by pilots may increase the workload they experience, thereby causing subsequent errors. In this case, the board believes the captain attempted but was unable to adequately perform the dual tasks of troubleshooting and flying the airplane. It was six seconds before impact when he called for maximum power. However, because of the prolonged power reduction, the airplane altitude and airspeed deteriorated beyond the point of recovery.

Lessons Learned

Since our first review of inflight emergencies, we've been told: 1) Maintain aircraft control; i.e., fly the airplane. 2) Analyze the situation. 3) Take proper corrective action.

Or as a favorite training flight IP paraphrased: aviate, navigate and then communicate. Remember, you've got to have clearly established priorities and the crew you fly with must know what your action will be and what you expect of them.

The ATC folks have a long list of questions they're going to want answered following an inflight emergency. Keep your priorities in line and fly the jet, or back up the person flying, before you get involved answering those questions. In this mishap, the first officer violated his responsibility to back up the captain. The check and balance crew coordination system is developed for just this case. The flight crew members must back each other up, especially when attention is diverted while handling an abnormal situation.

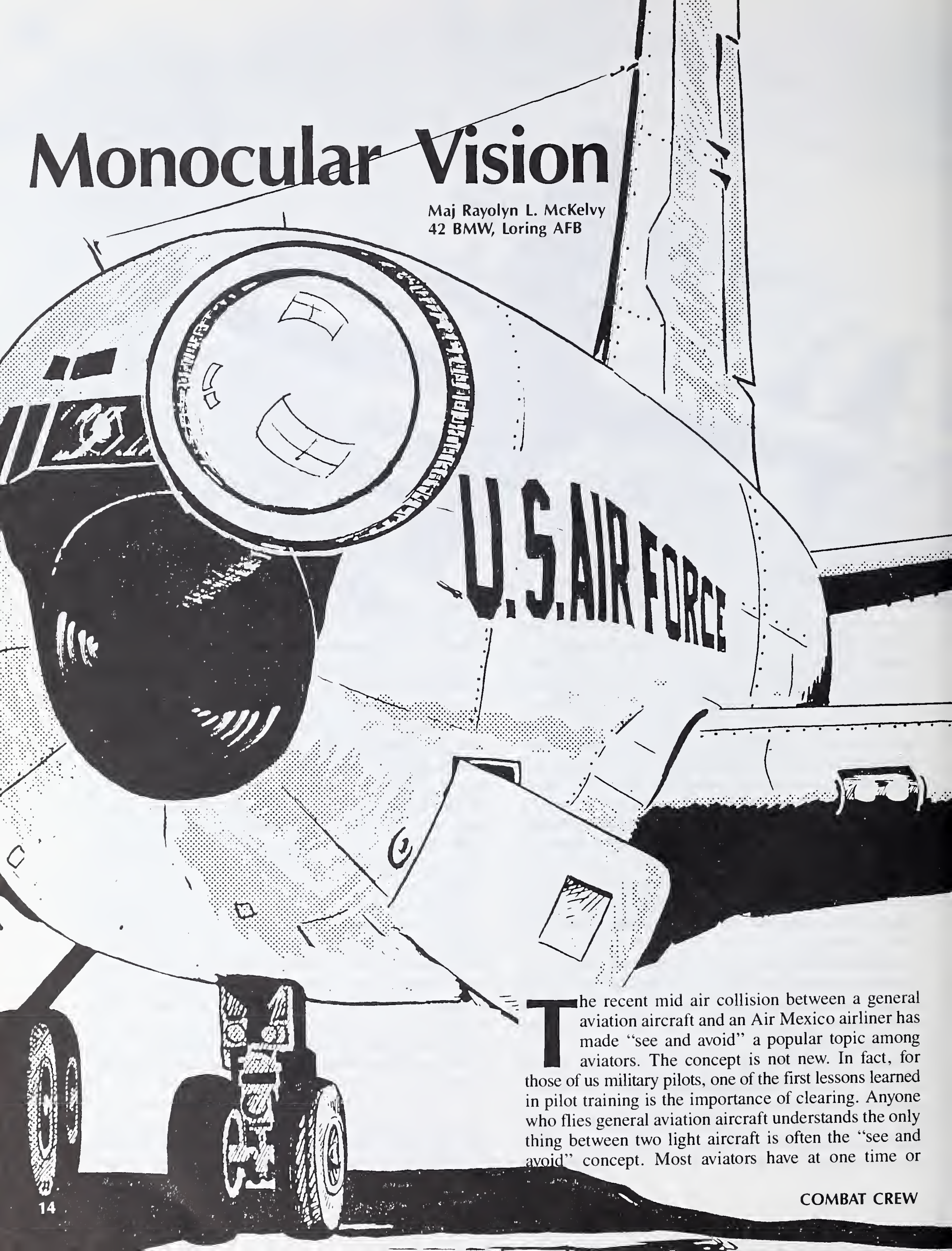
Galaxy Airlines crews, just like SAC aircrews, have the requirement to brief takeoff procedures or possible emergency situations that could occur during the critical takeoff segment. Not that a good takeoff briefing would have prevented this mishap, but taking those few extra minutes to brief takeoff procedures should have reinforced the flight crew's priorities and crew actions. It could have made a difference. Briefing a takeoff malfunction mentally prepares us for the abnormal situation.

The Air Force has made great progress in its flight safety record. There can be no excuse for an adequately trained and proficient crew to fly a "good airplane" into the ground. It's our responsibility to know our tech data, understand our mission and responsibilities and execute our missions accordingly. As SAC crew members, we're charged with tremendous responsibilities in an ever changing and demanding environment. Let's learn from the mistakes of others and fly smart.

—Mishap information extracted from the NTSB Aircraft Accident Report, AAR—86/01; comments by Captain L. John Sanlorenzo, 22 AREFW/SEF.

Monocular Vision

Maj Rayolyn L. McKelvy
42 BMW, Loring AFB



The recent mid air collision between a general aviation aircraft and an Air Mexico airliner has made "see and avoid" a popular topic among aviators. The concept is not new. In fact, for those of us military pilots, one of the first lessons learned in pilot training is the importance of clearing. Anyone who flies general aviation aircraft understands the only thing between two light aircraft is often the "see and avoid" concept. Most aviators have at one time or another found themselves close to the "near miss" range. It usually only takes one such incident to make us "true believers" in keeping our heads out of the cockpit. This phenomenon is particularly true for those of us who spend most of our flight time under radar control. We are lulled into the false attitude of trap number one: the ARTCC controllers will keep us safe from all other traffic.

Trap No. 1: **It's ARTCC's job to keep us apart.**

We all know this statement is only partially true. ARTCC will provide separation between IFR aircraft and between known VFR traffic. My desk is littered with Hazardous Air Traffic Reports. Each year we review the guidelines for traffic separation during annual instrument refresher training. Usually we understand what services are available from ARTCC. But it doesn't hurt to review the rules before we launch off to a strange airfield. Most of us know where conflict points are in our local area. Fortunately, we don't have too many close encounters in some of the remote areas we operate, such as Northern Maine. Up here there is very little VFR traffic to interfere with our low level flying. However, that leads to trap number two. We become complacent and allow our clearing habits to deteriorate.

Trap No. 2: **Complacency.**

When we do fly into a high density traffic area, our clearing technique is woefully inadequate. Our heads spin back and forth without really focusing on anything. And when we finally put our aircraft on the ground, we breathe a sigh of relief. But was it skill or just dumb luck that helped us avoid a near miss? Maybe we do clear adequately, but "enough" is never enough.

I'll bet you're hearing about these first two traps for the umpteenth time. "What more can be said about clearing," you ask. There is one more trap, Trap number three.

Trap No. 3: **Monocular Vision.**

National Transportation Safety Board accident reports are rife with mid air collisions. The reports often include an analysis of the relationship between the two aircraft from a bird's eye view. But what the board then examines is the most probable relationship of both aircraft as seen by the occupants of the other aircraft. This two-dimensional pictogram often reveals that both aircraft were hidden from each other's field of vision for a certain period of time. Usually the reason for interference with the field of vision is something we tend to overlook: the cockpit window supports, the head of the other pilot or the magnetic compass.

It is possible for two converging aircraft never to see each other because they are hidden behind a cockpit obstacle. But many times the case is that the "bogie" is fully in view of one of the pilots. However, it is visible only with one eye, hence, monocular vision. This fact of life also occurs near those obstructions mentioned before. The way the human eyes work is something we all learned in UPT and on which we receive refresher training periodically. Our IPs taught us "to focus on a cloud or the horizon" to avoid what is called "open field myopia," a condition where your eyes focus only a few feet in front of your face.

But what happens when your focal point falls near or behind an obstruction? One of your eyes will try to focus at infinity while the other tries to focus on the obstruction. The signals sent to your brain become confused. The brain doesn't know which input to accept, so it either reads the dominant eye input or it ignores both messages. If the dominant eye is focused on the obstruction, that entire area will be blacked out in your clearing picture. We aren't aware of this blank space because our brain normally follows a process called "closure" which means it automatically fills the gap with what we think we want to see. If you have ever twirled a lighted flashlight at night and noticed a complete circle of light, you have witnessed closure.

What happens when your dominant eye focuses on infinity (or a cloud) is somewhat different. With only one eye your visual acuity is reduced. The image is only seen through one eye, hence it is more difficult to determine distance and movement. Even if you stare at that area for a period of time, you probably won't see the target.

Fortunately, however, there is a solution to these man-made cockpit blind spots and human limitations. First, you must recognize where these obstructions occur. Take an inventory in your cockpit: posts, railings, visors, glasses, and other obstructions. As you sit on the ramp, try to "look through" these barriers and you should get a good idea of where these monocular blind spots are—where you can see with only one eye.

Second, develop a special clearing technique for these areas by simply moving your head a little to one side or the other to allow both of your eyes to focus in the target area hidden behind obstacles. It is as simple as that. The key is to make sure you are clearing with two eyes, not one. My experience in the KC-135 has been that often the first person to see a "bogie" is the person between the pilot's seats. The reason is not that he is a "better clearer," but probably because he is more mobile and moves his head to search for the target. We pilots tend not to want to move because movement might interfere with our cross-check or induce vertigo.

Clearing can be hard work, but knowing the vulnerabilities induced by your aircraft cockpit and how to overcome them may be the difference between a "tally ho" and a near mid air or worse.

About the author: A 1970 graduate of the USAF Academy, Maj McKelvy is the 42 BMW's chief of safety. He is a KC-135 pilot with over 2000 hours.

ASRS – Another Acronym You Might Want to Remember

Maj Richard D. Williams
SIFC Division

No, ASRS is not another type of controlled airspace to take its place among TRSA, TCA, ARSA, PCA, etc. ASRS stands for the Aviation Safety Reporting System; and though it has been around longer than some of the acronyms above, it is unfortunately not well known to the Air Force flying community.

Okay, So What's the Big Deal About ASRS?

Have you ever demonstrated your prowess in aviation (whether in flying, navigation, controlling, maintaining or just plain watching) to a somewhat lesser degree than you would care to be remembered for? Well, if you are like the author, I'm sure it has happened maybe at least one time! Or maybe you observed a deficiency in the aviation system that should be brought to the attention of somebody several paygrades above yours.

The ASRS was set up by NASA through the FAA for just that; to provide an avenue for anybody in the aviation community to identify potential problems and/or let their "faux pas" be known without fear of recrimination. Accordingly, the purpose of ASRS is to identify deficiencies and discrepancies in the national aviation system, to provide a knowledgeable basis for improving the current aviation system; and providing data for planning and improvements to future systems.

History of ASRS

The forerunner of the ASRS was developed back in the mid seventies after TWA Flight 514 crashed into the side of a hill west of Dulles International Airport. Unless you happen to be a real old head (like the author), this particular mishap would not raise your eyebrow. Anyway, prior to this mishap, the familiar "cleared for the approach" clearance was "understood" to mean a descent was authorized to the IAF altitude (no problem, providing the MSA for the route of flight happens to be lower than the IAF altitude). This is not the case, however, when approaching Dulles off airways from the west. Ironically, just six weeks prior to the mishap, a United Airlines flight received the same clearance and descended; fortunately for them the weather was VFR and the pilot climbed back up. United, however, had instituted an Anonymous Flight Safety Awareness Program that encouraged crews to report problems to the company; and the crew involved in the incident did just that. So, United pilots had been made aware of the potential problem at Dulles, but information collected under the United program was not disseminated throughout the aviation community.

The NTSB accident report duly noted the United program and this provided the impetus for the FAA to develop an incident reporting system so all users of the airspace system could benefit. The initial program was started in May 1975 and was called the Aviation Safety Reporting Program (ASRP). To encourage the submission of reports, the FAA offered a limited waiver of disciplinary action to those who submitted reports as long as the incident did not result in a mishap, involve reckless operation, gross negligence or involve a criminal offense.

Unfortunately, the ASRP was of limited success. Despite the FAA's promise, having the regulatory and enforcement agency collecting and using often sensitive incident data did not sit well.

The FAA soon recognized the error of its ways and asked NASA for help. NASA accepted the responsibility, renamed the program ASRS, and in April, 1976, began to handle the receipt, processing, analysis and "de-identification" of reports. ASRS headquarters is located at Ames Research Center, Moffett Field, California.

Design of the ASRS System

NASA's initial challenge was to develop a system the aviation community would trust. To do this, ASRS was designed around voluntary reporting that promised total confidentiality. As the "third party," NASA was in the position to gain the trust of "total confidentiality" within the aviation community. Additionally, the FAA offered immunity for individuals electing to report under the ASRS. Immunity is bifurcated (divided into two branches, for you non-english majors) in that both use immunity and transactional immunity are provided.

Use immunity (use of data obtained) is part of NASA's pledge of total confidentiality. This was first established in a FAA/NASA Memorandum of Agreement and a FAA Advisory Circular, but was further strengthened in 1979 with FAR 91.57. It states, "the Administrator of the FAA will not use reports submitted to NASA under the ASRS (or information derived therefrom) in any enforcement action, except information concerning criminal offenses or accidents."

Transactional immunity (waiver of disciplinary action) is a separate issue and is a carrot used by the FAA to further encourage the timely submission of reports from the civilian sector. This would apply if a violation actually occurred and was filed against an individual. Since normal FAA procedures are to report military violations directly to the offending service and let them take the appropriate action, transactional immunity does not apply to us.

Just Who Submits Reports?

ASRS has received reports from pilots, air traffic controllers, FAA inspectors, cabin attendants, mechanics, and a variety of other individuals. In fact over 60,000 reports have been received and current receipts are at record volumes.

There is a steady increase in the number of air carrier reports, but a drop off in military reports. This can most likely be attributed to a lack of awareness within the military of ASRS (when asked, very few SIFC students are aware of ASRS).

How Does ASRS Handle Reports?

Once a report is received it is read by a staff attorney who ensures it is not related to an aircraft accident or criminal act; if so, the report is submitted intact to the NTSB or Department of Justice, as appropriate. If the reviewer feels the report contains time critical information, it is singled out for priority handling. In any case, the reports are then routed to an analyst who is an expert in the area the report concerns. The analyst reviews the report and determines if a direct contact ("Callback") with the individual is necessary or desirable. A Callback would be made if the analyst feels additional information would be beneficial (less than 25% of reports). To insure a good rapport is established, all Callbacks are by telephone.

When the analyst believes he or she has all the necessary information, the report is sanitized. The top half of the report (which contains the reporting individual's name, address, telephone number, etc.) is removed and returned to the individual, stamped with the time and date the report was received. Additionally, any reference to aircraft names, numbers or individual and company names is removed from the report. This system is effective; in over 50,000 submissions, not one submitter's identification has been compromised.

After "de-identification" the report is further analyzed and coded for entry into the ASRS computer (data base) in a manner that makes it easy to retrieve information contained in the reports. The reports are then destroyed by shredding or burning. The information gained from the reports is the real product of the ASRS.

What's Done With the Information?

As mentioned earlier, the purpose of ASRS is to promote aviation safety. ASRS uses the data obtained in two ways. The first is to notify the FAA and the aviation community of the existence of alleged hazards in the system. The second is a little more complex and involves trying to understand why a hazardous condition exists.

Data is disseminated using five different methods:

a. Alert Bulletins — time critical notices sent to the appropriate individual or organization.

b. Special Data Requests — requested studies by the FAA, NTSB, or any other member of the aviation community.

c. Program Reports — periodic publications of constructive reports (sanitized) received, selected Alert Bulletins and responses, and one or more research studies by the ASRS staff.

d. Research Reports and Technical Papers — single topic reports addressing primarily human factors issues.

e. "Callback" Newsletter — Callback is a monthly one-page letter designed for the light, but timely, expression of safety issues relevant to the entire aviation community. Callback is mailed monthly to any organization or individual free for the asking.

There is a wealth of information available in the ASRS products, and most of it is free for the asking. SIFC has been receiving "Callback" for over three years and has requested and received several Research Reports/Technical Reports.

How Do I Submit A Report?

That's pretty easy. Reports are submitted on the NASA Form ARC 277. Forms are easily obtainable at any FAA office, Flight Service Station, or by writing direct to NASA Ames Research Center. Their address is:

NASA Aviation Safety
Reporting System
P.O. Box 189
Moffett Field, CA 94035

While writing you can also request to be added to their mailing list. You will then receive "Callback" monthly.

Summary

ASRS is a good system that can be used by the military. It should be noted, however, that use of ASRS does not relieve you of your responsibilities to submit OHRs or HATRs. Fly smart. Fly safe.

Flashlight (Alkaline) Battery Hazard

Maj Lynn Heath
Chief of Safety, 384 AREFW

Recently, an individual replaced the 1.5 volt, D-size batteries in a flashlight. The batteries were of two different brands and types (one general purpose and one alkaline battery). The flashlight was checked for operation and issued for use. Ten minutes later a worker returned the flashlight as inoperable. The inoperable flashlight was placed aside and a new flashlight issued. Twenty minutes later, the inoperable flashlight was checked for condition. The handle was too hot to hold and nearly burned the individual handling the flashlight. The individual then used a cloth to empty the batteries into a metal container so as not to damage the counter top. The plastic covering of the alkaline battery began to melt and was too hot to handle for 1.5 hours. The incident was reported to wing safety on an AF Form 457, Hazard Report.

Investigation of the incident found a warning on the alkaline battery which read: "Do not dispose in fire, recharge, put in backwards, mix with used or other battery types. May explode, leak or cause personal injury." The incident was caused by the mixing of two different types of batteries. Alkaline and rechargable batteries (nickel-cadium) should always be used by themselves.

Normally, general purpose (carbon zinc) and heavy duty (zinc chloride) batteries may be mixed together in the same flashlight or electronic component (portable radio, tape player, etc.). However, alkaline and rechargable batteries should always be used alone and never mixed with any other type of battery. Mixing of either of these two types of batteries could cause a hazard. For example, if a rechargable battery and an alkaline battery is used in a flashlight, the rechargable battery will probably lose its charge first. This may cause the alkaline battery to reverse its charge or leak.

The alkaline battery is an extremely powerful battery and should be handled carefully following the manufacturer's instructions for the battery and the equipment being powered by the battery. If the spring in the battery compartment should tear the protective coating of the battery, it could cause the battery to short out and overheat. An alkaline battery that overheats can reach a temperature of 200 degrees Fahrenheit which could cause burns when handling. For this reason, alkaline and rechargable batteries should be handled carefully at all times.

When handling batteries, use the following procedures:

a. Always use similar type batteries in a single flashlight or electronic component. Never mix alkaline or rechargable batteries with other battery types.

b. Never charge dry cell batteries except those that are denoted as rechargable by the manufacturer.

c. Check your battery compartment or flashlight casing for any breaks or metal parts that may damage battery casings. Any damage to the battery casing may cause shorts or leaks.

d. Check the battery casing before placing them in the flashlight or electronic component. Batteries with damaged casings could short or leak when placed into operation.

e. Use care when placing the batteries in the battery compartment. Rough handling may cause damage to the battery casing.

f. Use care when placing the cover on the flashlight. Ensure the spring end does not damage the battery casing or short the battery while twisting it on.

g. Should a battery short or leak, be careful how you handle the flashlight or electrical component.

— If the flashlight or electrical component begins to heat up, place it in a safe area until it cools down.

— If the batteries must be removed while the item is still hot, use a glove. Remember, a shorted alkaline battery can reach a temperature of 200 degrees Farenheit.

— Carefully remove the batteries over a disposable metal container. If the battery has leaked, harmful liquids will have contaminated the batteries or may flow out of the battery casing. In this case, use a plastic bag to contain the liquid, battery and any other contaminated items before disposal.

Don't get frustrated and throw everything in the trash. Most manufacturers have a guarantee to replace or repair, at their option, any device damaged by their batteries. However, this guarantee does not cover batteries that have been damaged by abuse, charging when not allowed and/or when mixed with other battery types. Check the battery guarantee with the manufacturer before disposing of item as they may require you to ship all components to verify the damage before they will honor their guarantee.

It Happened to Me

TSgt John H. Forbes
Utah ANG

I left the barber shop about four and headed for home. The route consisted of 10 miles of city streets. I was riding a Honda 350 motorcycle and wearing fatigue pants, cowboy boots, a T-shirt and a helmet. I was a senior in high school.

As I cruised up to an intersection, a car was in the lane to my left. The light turned yellow, and I decided I was too close to the intersection to stop so I accelerated to speed through the intersection. As I pulled away from the car beside me a large blue Plymouth sedan started a left turn in front of me. There was no place for me to go, so without even touching the brakes, I stood up on the footpegs, hoping to get thrown clear.

The radiator hit me squarely and I went airborne at a slight angle to my direction of travel. After flying between two signal light poles I landed in the vacant lot on the corner and slid in the gravel for several feet before stopping on my back. My left leg was in a "Z" or at least it felt like it.

Slowly I flexed my left foot—my toes moved. In relief I shifted my weight and felt the broken ends of my femur rub together. Laying my head back down, I stared up at the sky as a crowd quickly gathered around me. A Protestant minister knelt beside me and prayed over me while a passenger from the car that hit me cradled my head in her lap. Quickly a policeman with a motorcycle badge on his collar appeared and asked me some quick questions as the ambulance attendants attached an air splint to my leg.

I stayed conscious the whole time, but in the ambulance I began to go into shock. My teeth chattered and my shoulders shook like I was in a cold wind. The paramedic quickly treated my symptoms and within a few minutes I was in the emergency room of a local hospital.

> **"I stayed conscious the whole time, but in the ambulance I began to go into shock. My teeth chattered and my shoulders shook like I was in a cold wind. The paramedic quickly treated my symptoms and within a few minutes I was in the emergency room of a local hospital."**

My parents arrived and we spent a few minutes together before I was wheeled into surgery where a smiling nurse stuck a needle into my arm and asked me to count backward from a hundred. I don't remember reaching ninety.

When I woke up the next morning I immediately inspected my leg. It was swollen twice its normal size, and purple and black bruises covered it from my upper thigh to my knee. A foot-long incision was stitched along the line of the cut. Carefully, without sitting up completely, I looked around my room. The first thing I reached for was my boots. They were okay, although I'd been afraid they'd cut them off my broken leg. (I've seen too many cowboy movies.) The next thing I picked up was my helmet from the bedside table.

Turning the candy red plastic over I saw a two-inch vertical crack in the center of the forehead that then branched off at an angle for another inch. Placing the helmet upside down in my lap I peeled back the inside padding. Sure enough the crack went all the way through the thick plastic. I looked up at the mirror on the wall opposite me. The lower half of my face had most of the skin scratched off and my chest was lacerated and bruised. Looking at the cracked helmet in my lap, however, made me glad I had a strict father.

You see, my father made a deal with me when he let me buy the motorcycle. As long as I wore the helmet, I could ride my two-wheeler. I stuck to my part of the deal and so did he, even after my accident. I never wore that particular helmet again, but it sat where I could gaze at it for a long, long time.

Attention to the Last Detail

Maj George G. Asadourian, Jr.
Chief of Safety, 319 BMW

In 1969, I began my assignment to Vietnam as a forward air controller (FAC). My aircraft was the 0-1, a single engine tail dragger. I was living with, working with and supporting the MIKE (Mobile Strike Force) and as you probably guessed, was called a MIKE FAC. The MIKE force was a light infantry element comprised of indigenous personnel and led by the American and Australian Special Forces. Normally operating in battalion strength, the MIKE force would be out in the field for three weeks at a time with one week intervals for rest and refitting. A highly active element, the MIKE force was always on "search and destroy" missions and the airstrikes we directed were always for support when they were "in contact" with enemy forces. Occasionally we would direct artillery strikes for the same purpose.

Although assigned to the 21st TASS (Tactical Air Support Squadron) at Cam Ranh Bay, I was flying out of Pleiku AB and living on the Company B, 5th Special Forces Group Compound (about one-half mile from Pleiku). Usually, before every mission, I would stop at the Army TOC (Tactical Operations Center) for a quick briefing. On this particular day the forces in the field had relayed a special request to the TOC. I was asked to pick up two cartons of cigarettes at the BX and deliver them, via air drop, to the guys on the ground. Not only was it a "no sweat" operation, it even sounded exciting—a small diversion from the routine.

On my way to the flightline I stopped and purchased the cigarettes. I taped the two cartons together and was on my way. It was a nice cool morning, as so many were over the central highlands. My little 0-1 cut the air swiftly and noisily, a few thousand feet above the ground. I realized that my mission today involved something different than what I was normally accustomed to and was very cognizant of the fact that a little extra care would be required—on my part—to do it right. I wasn't using the word safety, but was thinking of it in an oblique way. Before long I was over the "target" area and talking to our guys. They had spotted me and were giving me a "shiny." By doing this, i.e., shining their mirror at me, I could give them an accurate navigational fix, and in this case, know where to drop my "care" package. As usual their own navigation was extremely precise. I looked the area over carefully. There we were. . .them down there and me up here. The stage was set. Conveniently, they were located about two-thirds of the way down and beside an open field. For camouflage they remained in the wooded area at the very edge.

The approach looked clear and I, being as safe as ever, began a left downwind. Soon I was turning base and then final, using the field and tree line as my reference for final approach. My power was back and I was constantly descending. My airspeed was increasing. By the time I reached the "target" the guys on the ground had moved out of the dense foliage. They were waving at me and were suddenly bigger than life. I was very surprised because I had not planned on getting that low. I guess I had fallen into the "target fixation" syndrome. I was low and I was fast. I was holding the cigarettes at the edge of the window. The moment came and out they went. I followed the path of the package and watched the guys, now behind me, scrambling for the loot. After a period of a second or two—maybe three—I decided I had looked in that direction long enough and should probably get back to flying the airplane. I looked forward. Precisely in front of me and on a direct impact path with my right wing, was a blur—a tall blur. I was below it. In the very short, split second timing it took me to react I knew exactly what the blur was. I didn't see the leaves or the branches or the color, but I knew it was a tree. The stick was in my gut and as quickly as I saw it, it disappeared beneath me.

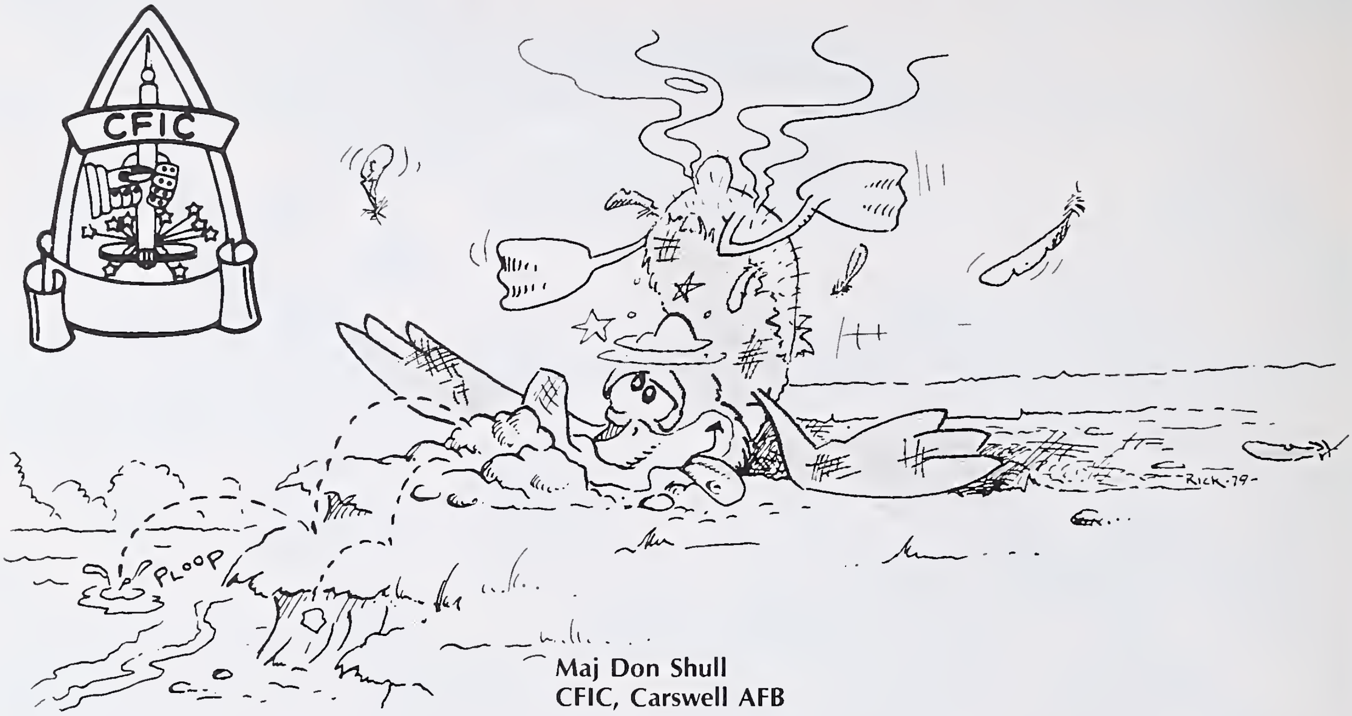
I can assure you that airspeed is your friend. My 0-1, which normally cruised at 65-70 kts had accelerated to 110-120 kts during the descent. My instinctive reaction to yank the stick back was the only cue this fast little plane needed to instantly elevate both of us to safety. I pushed the power up and continued climbing, made a couple of left turns and looked down from my perch, at approximately the same position that I had earlier planned my approach. How could I have missed it? There at the end of the field stood one very tall tree. It stood alone. Obvious now, but not before. Perhaps

I hadn't seen it because I had not planned such a low approach. Of course I was breathing much harder now and knew how lucky I had been to have turned my head when I did. Another half second would have been too late. After thanking me for the smokes, the troops confirmed my close call, "Gee, we thought you were going to hit that tree." I knew that God had smiled upon me. I had been given one more chance. After regaining my senses, I realized how foolish the whole venture had been—something I would never do again.

I hope that none of you will ever lull yourselves into thinking that an occasional deviation from the norm, from standard practice and procedure is okay. It never is! Standard operating procedures have been established with safety in mind and safety factors are built in. Deviations that may entice you to throw the book out are dangerous and should always be considered unacceptable by your standards. When you're planning your next mission, plan it by the book and make sure that every facet of the mission is scrutinized, briefed and understood by the crew. What's not obvious to you may be easily recognized by another crew member. That's called crew coordination.

Details, details, details! Don't ever get caught by that one last "gotcha," that one tall tree. . .the last detail.

DUCK UNDERS



Maj Don Shull
CFIC, Carswell AFB

Have you ever had a pilot tell you to "shoot for the first brick" while flying an approach in one of SAC's heavies?" Are you one of those pilots who are firmly convinced that when the runway is short, wet and/or icy, you need to land in the first 500 to 1000 feet of the runway to insure adequate stopping distance? Then why do experienced SAC instructors preach "aim for the fixed distance markers on every approach?"

Major Ron Sams discussed some of the concepts of Duck Under in his May 1979 *Combat Crew* article, but perhaps it's time to take another look at the subject of short landings/duck unders in light of the continued emphasis on off station training flights and our increased exposure to the strange field environment.

In pilot training and while flying ACE we were taught to use different aim points for landing. On an instrument approach, we followed the glideslope to decision height and used the fixed distance marker for our aim point, but on visual approaches our IPs insisted we "shoot for the first brick." Short field landings or approach end barrier engagements were eventualities for which we needed to prepare. This **specialized** training was necessary for fighter type operations, but it doesn't necessarily transfer over to all other aircraft—especially to the heavies. Let me tell you why.

In fighter type aircraft, you have less difficulty judging your height above the ground while in the landing flare. (Your gear is usually only six to ten feet below the cockpit.) In a heavy the problem of judging your height above the ground becomes more difficult. Your main gears are 65 or more feet behind you, and in the landing attitude your gear can be from over 20 feet (in a –135) to 30 feet (in a KC-10) below your cockpit. The philosophy of following the instrument glide path to the fixed distance markers (1000 feet down the runway) assures us of adequate gear clearance over approach lights and over any obstacle in the approach zone.

Take a look at this typical 2.5 degree approach taken from the Boeing 707-300B Pilot Training Manual. You can see the normal body angle of the 135 is about 3.0 degrees nose up. If the pilot is on the ILS glide path and on speed crossing the threshold, his eye level is 43 feet 8 inches above the runway, but the bottom of his gear is only 20 feet 8 inches above the ground. (Remember that the ILS RPI usually coincides with the fixed distance markers, and pilots routinely use these as their aim point when "going visual" from an instrument approach.) **(See figure 1.)**

What happens if we visually fly the same 2.5 glideslope angle, but fly it to a point 500 feet from the threshold? As this illustration shows, "on glideslope" gives a 21 foot 10 inch "eye level" at the threshold, but your gear is already on the ground. Have you ever seen mysterious tracks in the overrun? **(See figure 2.)**

Now, let's change the aircraft body angle from three degrees to four degrees and drag in the approach. This

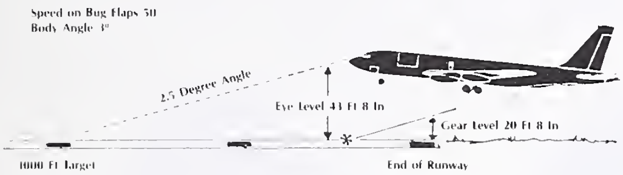


Figure 1. Approach path to 1000 feet target with a 2.5 degree approach angle.

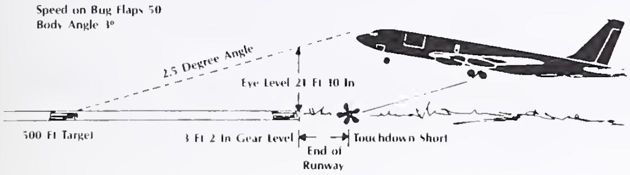


Figure 2 Approach Path to 500 Feet Target With a 2.5 Degree Approach Angle

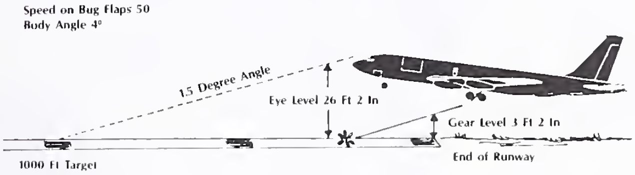


Figure 3 Approach Path to 1000 Feet Target With a 1.5 Degree Approach Angle

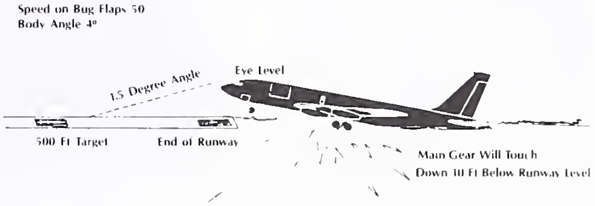


Figure 4 Approach Path to 500 Feet Target With a 1.5 Degree Approach Angle

increased angle of attack will require an increase in power to maintain the target airspeed. Careful attention must also be given to the power reduction point since the "normal" angular view of the target has changed in the windshield. If you use the normal touchdown target (fixed distance marker), a low final approach will give you a threshold clearance under five feet. This is a common "unconscious duck under." If you have ever crossed the threshold with the ILS glideslope at the top of the case on a visual approach, you have this tendency! **(See figure 3.)**

AFM 51-37 states that duck unders must be avoided. This includes conscious attempts to land within the first 500 to 1,000 feet of the runway. Establishing a visual profile to land short of the normal touchdown point usually results in high sink rates and poor thrust/lift relationships which may cause undershoots and/or hard landings. Now throw in low visibility, landing illusions and/or wind shear and you've got real problems. Especially if you drag in your approach while changing your aim point to 500 feet. **(See figure 4.)**

The above illustration vividly demonstrates a short, hard landing caused by changing an aim point on a flat, drug in approach.

Adequate landing gear clearance will always be assured if an approach angle comparable to the ILS glideslope is maintained to the touchdown target 1000 ft down the runway. This is why AFM 51-37 stresses the fixed distance markings as an aiming point for touchdown, and why 1CEVG and your local Stan-Eval will severely critique anyone demonstrating "duck under" tendencies during landing. Practice makes perfect. So don't practice unsafe approaches. Our tech orders say "steep approaches" are inherently dangerous, but so are flat, drug in approaches and short touchdown targets.

Pilots should base all landings upon the normal touchdown point from the instrument approach. This normal approach is a two and one-half to three degree glideslope to the 1000-foot marker. Utilize all available aids (VASI, GCA, ILS, 60-1) to monitor and maintain the normal glide path. If stopping distances are insufficient, do not attempt to land—delay until conditions improve or proceed to an alternate.

PROFESSIONAL PERFORMERS

Missile Crew

The 351 SMW split crew R-023/R-031, Capt Bonita J. Toney, MCCC and 2Lt Laura L. Olsen, DMCCC, is SAC's Missile Crew of the Month.

After assuming alert duties at Charlie Launch Control Center (LCC) recently, the crew noticed several simultaneous abnormal indications. The launcher status missile indicator lights came on and went off, the emergency lights went out, the overhead lights increased and decreased in intensity, and the motor generator made whirring noises. After initiating the Emergency Power and Air procedure checklist, the crew detected a strange smell, haze in the accoustical enclosure, and heat rising from the motor generator. While processing the LCC Fire and Overheat checklist, the crew ensured cooling air to the equipment racks and proceeded with the fire checklist, determining the overheat condition began while the motor generator was operating on AC power. While monitoring this condition, smoke continued rising from the motor generator access cover. Deciding to wait no longer, the crew proceeded with the LCC Equipment Shutdown procedure. As they completed shutdown, they noted the isolation actions had caused the smoke to cease. However, the smoke was too thick for human safety and the crew decided to evacuate the capsule. They coordinated with all appropriate agencies and transferred custody of their reentry vehicles.

Using their technical expertise and sound professional judgment, split crew R-023/R-031 completed all emergency shutdown procedures in a timely manner, thus preventing further damage and minimizing potential for personal safety.

Munitions Maintenance

Sgt Douglas L. Baumgartner, 2 MMS, Barksdale AFB, is SAC's Munitions Airman of the Month. Currently assigned as a weapons release team chief, Sgt Baumgartner has earned a reputation as an acknowledged authority on the highly complex B-52G weapons release suspension and electrical systems. Recently an aircraft failed the critical circuits check (CCC) portion of the alert preparation. Since the CCC has no formal troubleshooting procedures in the applicable T.O.'s, he contacted three other B-52 bases and the technical representatives to find out if they had experienced a similar malfunction in the past. Working ten 12-hour days, using only wire schematics, he was able to isolate three burned out diodes, a shortened resistor box, and a relay that had been improperly wired. His determined efforts and exceptional systems knowledge not only produced an alert ready aircraft, but also preliminary troubleshooting procedures for the CCC.

Flying Crew

Crew S-150 of the 407 AREFS, Loring AFB, is SAC's Flying Crew of the Month. The crew, Capt Lance Kaplan, IP; 1LT Eugene Tucker, P; Capt Patrick Bolibrzuch, IN; and TSgt Frank Huckabee, IBO, were scheduled for a higher headquarters round robin from Loring. This was the aircraft's first sortie after ground alert. The fuel load was 155,000 pounds and a heavyweight wet takeoff at maximum takeoff rated thrust was planned. After rotation and climb to 600 feet AGL, the number two engine rolled back, lost water and violently compressor stalled. Almost immediately afterwards the number two fire warning light illuminated as a burning smell filled the crew compartment. The flaps were retracted, the number two throttle was cut off and the fire switch was pulled. Capt Kaplan smoothly flew the heavyweight aircraft straight ahead at a 300 to 400 foot per minute rate of climb to gain precious airspeed. Sgt Huckabee went to the back of the aircraft to monitor the engine—no fire damage was visible. With the aircraft under control, at a safe airspeed and altitude, Lt Tucker ran the emergency and normal checklists. Capt Bolibrzuch expertly handled communications and navigation to assist the pilot team. The crew flew to the designated fuel jettison area and adjusted their gross weight by 105,000 pounds and then flew an uneventful three engine approach and landing. Maintenance later identified the cause of the engine failure as catastrophic failure of the third stage compressor with subsequent stator disintegration, severing the oil pressure lines and reservoir. The engine casing had been completely cut through over almost two-thirds of its circumference. Excellent airmanship, quick reaction, and superb crew coordination contributed to the safe and successful handling of this inflight emergency. Capt Kaplan and his crew epitomize the professional SAC crew.

Missile Maintenance

SSgt Richard L. Sayers, 351 SMW, Whiteman AFB, is SAC's ICBM Maintenance Airman of the Month. Assigned to the Electronics Laboratory of the Field Missile Maintenance Squadron, Sgt Sayers continually makes the extra effort to ensure mission capability and readiness. A few of his responsibilities included Due in From Maintenance (DIFM) monitor for ELAB and alternate COMSEC monitor for over 170 COMSEC items. He was selected as the wing representative to the ATC/SAC Training Conference to revise the 411XOA STS and develop the basic course of the ATE Electronics Laboratory Course. Sgt Sayers' initiative in repairing a faulty Guidance and Control Liquid Coolant Test Set that had a faulty flow meter allowed RIVET Mile personnel to continue their activities, saving money by preventing lost work time. Sgt Sayers has also maintained a 100 percent codes testing pass rate.

Aircraft Maintenance

SSgt Robert L. Sanders, 9 SRW, Beale AFB, is SAC's Maintenance Airman of the Month. Assigned as a J-58 engine test cell senior manager, Sgt Sanders was hand selected for field evaluation of the newly proposed 12000L test cell cab and adapter kit. His thorough analysis, critique and inputs resulted in the successful refurbishment and standardization of all 12000L test cells at 9 SRW detachments around the world. Under his supervision a complete setup and changeover of the new 12000L test cell cab was accomplished at Beale in less than three days. Other SAC units required almost two weeks before achieving full operation while utilizing similar equipment. Upon final inspection and certification, corporate engineers from aerospace electronic industries, manufacturers of the test cell, commended him for his professional and technical expertise.

Aircraft Maintenance

Flying Crew

Munitions Maintenance

Missile Maintenance

THE CUTTING EDGE

Off Duty Safety

Capt Dennis J. Beers
4315 CCTS

How often have you or a coworker missed a day of work because of some off the job injury, or have known of someone who has been severely injured or killed in an accident that occurred off duty?

Such off duty injuries or deaths affect the unit's mission readiness to the same degree as a work related injury or death. The loss of a crew member, administrative specialist, squadron commander, etc., due to an injury while off duty can be as significant to the operational or training mission as it would have been if the injury had occurred while on duty. The number of leisure time injuries is shocking. In a recent year, the National Safety Council reported 44,100 fatalities in off duty activities as compared to 14,200 fatal injuries on the job!

Perhaps one reason safety is not stressed as much for off duty injuries may be because most people are unaware of the "hidden" or "indirect" costs to the military. Such losses, however, are real and rise from the injured employee being absent from his or her duty station or reduced efficiency when the individual returns to work while still recovering from the injury. Another impact on mission effectiveness is the disruption of work schedules that off duty injuries can create. For instance, how often have you seen a change to the alert schedule because a crew member suffered an injury while playing intramural sports or some other outside activity? It would therefore seem logical that each unit's safety program should place more emphasis on off duty safety.

Off duty injuries are most often classified under three types: transportation, home and public. Transportation injuries are caused by or result from accidents involving a moving automobile, truck, bicycle, train, boat, airplane, or pedestrians when a moving vehicle is involved. Home injuries include those incurred in the home by firearms, machinery, fire, explosion, electricity, toxic materials, falls, animal/insect injuries or other causes. Finally, public injuries are those caused by firearms, fire, explosions, falls, slips, assaults, exposure to heat or cold, sports and other causes that occur outside the home. This is certainly not an all inclusive list of off duty injuries; however, these are mentioned merely to give you an idea of their diversity.

Think of how many individuals you know or have heard of who have suffered off duty injuries and compare that to the number of on the job injuries. I can think of very few job related injuries that I or other crew members have suffered. On the other hand, I can think of many injuries and fatalities that have occurred to coworkers that were in no way duty related.

As you have probably heard many times: An ounce of prevention is worth a pound of cure. By realizing that off duty injuries can impact your unit's effectiveness in much the same way as on duty injuries, we can begin reducing these types of injuries.

Each individual is responsible for mission effectiveness. An integral part of this responsibility is performing that mission to the best of your ability while ensuring your safety and that of others both on and off duty. Achieving this goal will lead to the success of the overall mission.

About the author: Capt Beers is assigned to the 4315th Combat Crew Training Squadron where he is an ICBM Emergency War Order Instructor (EWO). Prior to this assignment, he was an EWO instructor at Whiteman AFB where he received a Master of Science Degree in Industrial Safety from Central Missouri State University.

SAC SAFETY SCREEN

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW AFR 127-2/SS1.*

644 BMS, K I Sawyer Crew E-24: AC Capt John B Feda, P 1Lt Steve J. Matacia, RN Capt Lloyd D Deserisy, NN 1Lt Barry J Cousler, EW 1Lt Russell J Davis, G SSgt Michael L Simmons

644 BMS, K I Sawyer Crew E-33: AC Capt Thomas M McEwan, P Capt Harry J Bender, RN Capt Ralph P Millsap Jr, NN 1Lt Mark P Zimitch, EW 1Lt Anthony J Griffin, AG AIC Christopher A Gottlieb

668 BMS, Griffiss Crew R-21: AC Capt Stephen B Thomas, P Capt Thomas M Jaszewski, RN Capt James J Gallagher, N 1Lt Eric Kendall, EW 1Lt Timothy A Avey, G AIC Michael L Tyson

668 BMS, Griffiss Crew R-23: AC Capt Patrick L Ebner, P 1Lt David M Whittemore, RN Capt Christopher Cahill, N 1Lt Russel J Huard, EW 1Lt Anton Eret Jr, G SSgt Andrew W Sams

668 BMS, Griffiss Crew R-13: AC Capt Robert M Komlo, P 1Lt Eric R Reinhard, RN Capt Wesley A Hewitt, N 1Lt David M Kaplan, EW 1Lt Ricardo Rodriguez, G SrA Michael A Mays, 1RN Lt Col Brian H Cioli

128 AREFG, Gen Mitchell Fld, Milwaukee WI: AC Capt Steven J Katerinos, P 1Lt Jon E Coulter, N 1Lt Michael E Stasiewicz, IBO SMSgt Earl N Gauerke

344 AREFS, Seymour Johnson Crew S-103: AC Capt Mark Heatherington, P Capt Alfred Honrath, FE TSgt Frank Groves, BO TSgt John Mehall

344 AREFS, Seymour Johnson Crew E-111: AC Capt Robin Sanders, P Capt Gary Kreider, FE TSgt Mike Reed, BO SSgt David Pileski

911 AREFS, Seymour Johnson Crew S-001: AC Capt Tim Gann, P Capt Tony Morrison, FE TSgt David Spalding, BO TSgt Danny Turberville

911 AREFS, Seymour Johnson Crew E-011: AC Capt John Butcher, P Capt Bill Gibbs, FE TSgt Myron Troutman, BO TSgt Teddy Davis

97 AREFS, Blytheville Crew E-116: AC Capt Richard A Busa, P 1Lt Michael L Brickner, N 1Lt Curtis M Jones, BO A1C Bradely A Poppe

97 AREFS, Blytheville Crew E-120: AC Capt James M Ratti, P 1Lt Keith N McDonald, N 1Lt Vincent L Elliot, BO A1C Frank M Renko

340 BMS, Blytheville Crew S-40: AC Maj Melvin C Williams, P 1Lt Joey D Gonzaga, RN Capt Ronald D Edwards, N 1Lt William H Taylor, EW 1Lt Richard C McEachlin, G Sgt Joseph O Preiss

340 BMS, Blytheville Crew R-43: AC Capt Derrick A Hoxie, P 1Lt Robert J Hoffman, RN Capt Max S Dudzic, N 2Lt Timothy P Bush, EW 1Lt James P Brown, G A1C Carlton J Anderson

41 AREFS, Griffiss Crew R-106: AC Capt James C Harris, P 1Lt Clifford E Thompson Jr, IN Capt Randy K Thompson, BO Sgt Melanie Potter

41 AREFS, Griffiss Crew R-112: IP Capt Robert M Koeller, P 1Lt Kevin S Vaille, P 1Lt Lionel H Wynn, N Capt Mark R Holliway, IBO TSgt George Reschetnikow

41 AREFS, Griffiss Crew R-118: AC Capt Robert A McClain, P Capt Keith G Brown, N 1Lt Bud L Brooks, BO SrA Damon DiDonato

44 SMW, Ellsworth Crew S-222: MCCC 1Lt Russell J Blaine, DMCCC 2Lt Michael H Clemente

321 SMW, Grand Forks Crew S-030: MCCC Capt John R Brian, DMCCC 2Lt Gregory A Taylor

341 SMW, Malmstrom Crew R-132: MCCC 1Lt Eugene M Cauvin, DMCCC 2Lt LeRoy D Smith

351 SMW, Whiteman Crew E-081: MCCC 1Lt John F Corrigan, DMCCC 2Lt Edmund R Papczun

308 SMW, Little Rock Crew E-011: MCCC 1Lt Michael W Peel, DMCCC 1Lt Mark W Clark, MSAT TSgt Jimmie G Sharp, MFT Sgt Darryl G Bickford

308 SMW, Little Rock Crew E-084: MCCC Capt Joseph A Thibault, DMCCC 1Lt Jeffery F Geller, MSAT Sgt Gregory L Noechel, MFT Sgt David E Hawk

91 SMW, Minot Crew E-043: MCCC 1Lt John E Anderson, DMCCC 2Lt Rese Farrish

321 SMW, Grand Forks Crew R-134: MCCC 1Lt John J Doherty, DMCCC 2Lt Michael J Yaguchi

91 SMW, Minot Crew R-063: MCCC Capt L Bryant Helton, DMCCC Capt Joe L Hogler

91 SMW, Minot Crew S-226: MCCC Capt Allen R Roberts Jr, DMCCC 1Lt Donald Kniesche

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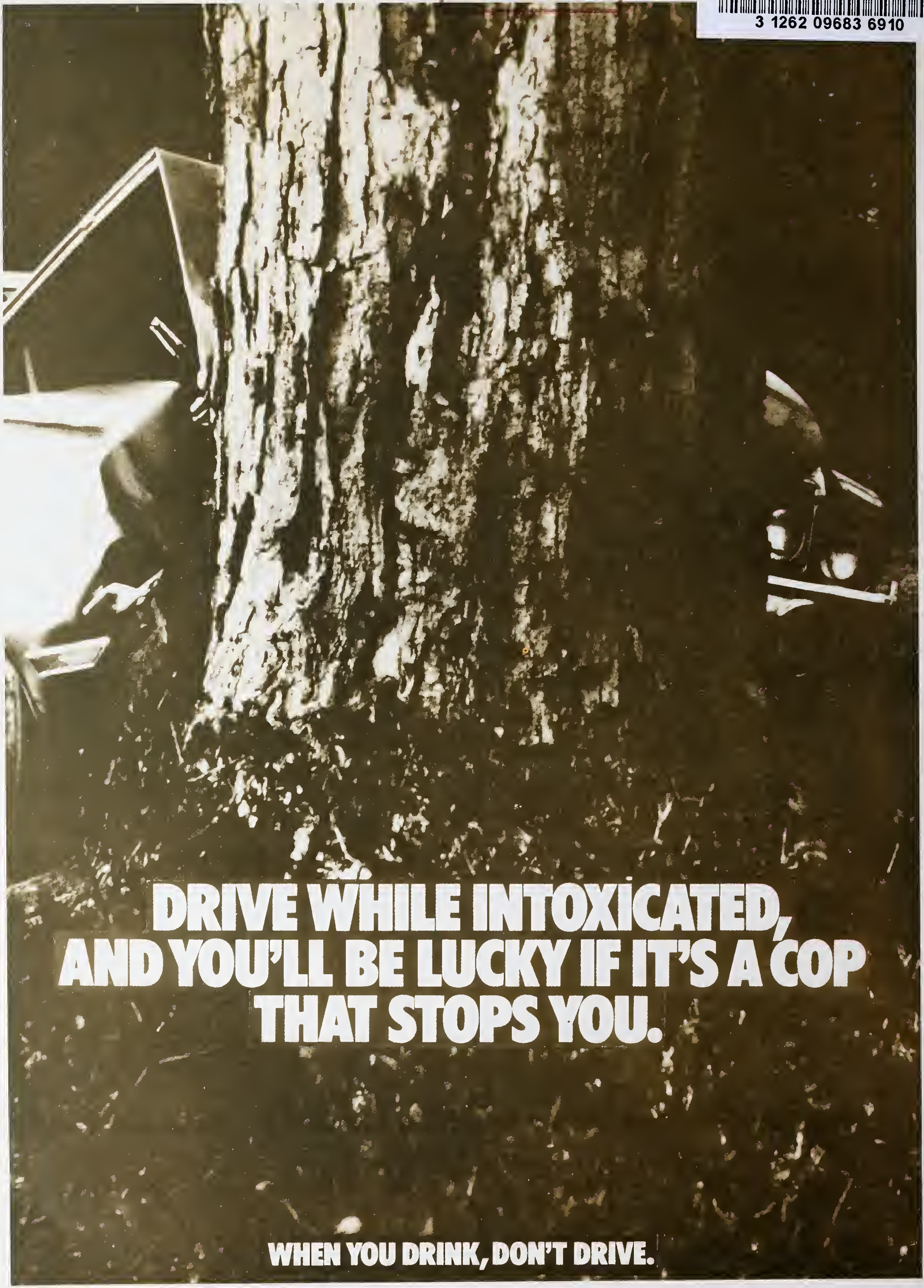
DRIVE WHILE INTOXICATED, AND YOU'LL BE LUCKY IF IT'S A COP THAT STOPS YOU.
WHEN YOU DRINK, DON'T DRIVE.

A message from the Reader's Digest Foundation